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10/008,379	11/05/2001	Garrick Maenle	CYM-037	4705

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EXAMINER	
FINEMAN, LEE A	

ART UNIT	PAPER NUMBER
2872	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/008,379	MAENLE ET AL.	
	Examiner	Art Unit	
	Lee Fineman	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 April 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *130,131,133-137,139-144 and 170-178* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *130,131,133-135,137,139-144 and 170-178* is/are rejected.

7)☒ Claim(s) *136* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 September 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to an amendment filed 13 April 2007 in which claims 134-135, 137, 172, and 177 were amended, claim 178 was added, and claim 132. Claims 130-131, 133-137, 139-144, and 170-178 are pending.

NOTE: although claim 130 was labeled "(Currently Amended)," it was clearly previous presented as evidenced by the remarks and will be treated as such. However, applicant is reminded that the status identifier of each claim must be included and accurate or the amendment can be held as non-compliant.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 178 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Newly added claim 178 contains the limitation "wherein the performance of the coarse focus action comprises stepping the imaging between the different coordinates along the focal axis, wherein a step size of the imaging is gradually reduced, and **wherein the coarse in-focus coordinate is determined at the smallest step size**." However paragraph [0149] of the

specification and fig. 30 state that the fifth z-position is the coordinate, which is not at the smallest step size (i.e., 13th z-position). Therefore, this limitation is considered new matter.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 130-131, 133-137, 139-144, 169-170, 173 and 177 are rejected under 35 U.S.C. 102(e) as being anticipated by Douglass, US 6,215,892 B1.

Regarding claims 130, 137 and 169, Douglass et al. disclose an automatic focusing method (see figs. 13-15) for an optical system (see figs. 1-2) comprising: performing an initial coarse focus action (see column 11, lines 9-32 and fig. 13A, steps 220-230) along a focal axis (Z) at a scan position corresponding to a point on a surface of a slide (220); and respectively performing a plurality of subsequent fine focus actions (see column 11, lines 33-40 and fig. 13A, steps 232-240) along a plurality of focal axes (238) at a plurality of scan positions (see at least column 9, line 66-column 10, line 11) corresponding to different points on the slide surface (see fig. 15), wherein the performance of at least one/each of the fine focus actions comprises obtaining images of the slide (see at least step 234) each of which has a two-dimensional array of pixels of 640x480 (with CCD camera 42, see column 6, lines 30-33 and column 14, lines 22-24) at a plurality of coordinates within a predetermined range along the respective focal axis (238),

and selecting one of the plurality of coordinates as a fine in-focus coordinate (244) based on an examination of the pixel arrays of the image (fig. 13A).

Regarding claim 131, Douglass et al. further disclose wherein the coordinates are evenly distributed within the predetermined range (80, see fig. 15 at least when all points are "adequate").

Regarding claim 133, Douglass et al. further disclose wherein the performance of each coarse focus action comprises determining a coarse in-focus coordinate (fig. 13A, steps 220-230) along the focal axis (Z axis).

Regarding claim 134, Douglass et al. further disclose wherein the performance of each fine focus action is based on the in-focus coordinate determined in the coarse focus action (fig. 13A and column 9, line 66-column 10, line 11).

Regarding claim 135 and 177, Douglass et al. further disclose wherein the performance of the at least one of the fine focus actions comprises estimating an in-focus coordinate along the respective focal axis as a function of the in-focus coordinate of a global focal plane (see figs. 11, 12 and 15) and wherein the at least one of the fine focus actions comprises the plurality of fine focus actions (fig. 13A, steps 232-240).

Regarding claim 136, Douglass et al. further disclose wherein the performance of the coarse focus action comprises repeatedly obtaining an image of the slide at different coordinates along the focal axis until a coarse in-focus coordinate is determined (fig. 13A, steps 220-230).

Regarding claims 139-140 and 173, Douglass et al. further disclose wherein the performance of at least one of the coarse focus action and each fine focus action comprises: obtaining images of the slide at a plurality of coordinates (steps 222 and 234) along the focal axis

(Z); determining a plurality of focus scores (pixel variance); and selecting one of the coordinates as an in-focus coordinate based on the maximum focus score (244 and column 11, lines 33-40).

Regarding claim 141, Douglass et al. further disclose wherein the slide carries a biological specimen (column 5, lines 3-5).

Regarding claim 142, Douglass et al. further disclose wherein the coarse focus action and the fine focus action are performing during a single image scan (see figs. 14 and 15).

Regarding claim 143, Douglass et al. further disclose wherein the performance of one or both of the coarse focus action and fine focus actions comprises moving an element (46, see fig. 2) of the optical system relative to the slide surface to coordinates along the respective focal axes.

Regarding claim 144, Douglass et al. further disclose wherein the performance of the fine focus actions comprises moving an element (38) of the optical system relative to the slide along a scan axis (X axis and/or Y axis) to the respective scan positions.

Regarding claim 170, Douglass et al. further disclose wherein the examination of each of the pixel array comprises comparing pixels to each other (pixel variance see steps 222 and 234).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 175 is rejected under 35 U.S.C. 103(a) as being unpatentable over Douglass et al. in view of Dunlay et al., US 7,117,098 B1.

Douglass et al. discloses the claimed invention except for wherein the slide comprises at least three fiducial points and the method further comprises determining the global focal plane based on the at least three fiducial points. Dunlay et al. teaches in column 14, line 65-column 15, line 41 focusing techniques using at least three fiducial points to define the global focal planes is known in the microscope art. It would have been obvious to one of ordinary skill in that art at the time the invention was made to use at least three fiducial points as taught by Dunlay et al. in the system of Douglass et al. to provide better sample location accuracy for faster focusing.

5. Claims 171-172 and 174 are rejected under 35 U.S.C. 103(a) as being unpatentable over Douglass et al. in view of Brenner et al., "An Automated Microscope for Cytological Research: A Preliminary Evaluation," The Journal of Histochemistry and Cytochemistry, Vol. 24, No. 1, pp. 100-111, 1976.

Douglass et al. discloses the claimed invention except for wherein the pixel comparison comprises comparing gray scale values of the pixels; wherein the gray scale value comparison comprises comparing gray scale values between pairs of pixels separated by a fixed number of pixels; and wherein the focus score for each of the pixel arrays is determined in accordance with the equation $f(z) = \sum\sum(G_i(z) - G_{i+n}(z))^2$, where i is an index ranging over all imaging points, in order, along a scan line j, n is an integer, z is a position along the focal axis, G_i is the transmission gray level between pairs of points separated by n pixels, and $f(z)$ is the focus score. Brenner et al. teaches an autofocussing method including comparing gray scale values of the

pixels; wherein the gray scale value comparison comprises comparing gray scale values between pairs of pixels separated by a fixed number of pixels; and wherein the focus score for each of the pixel arrays is determined in accordance with the equation $f(z) = \sum\sum(G_i(z) - G_{i+n}(z))^2$, where i is an index ranging over all imaging points, in order, along a scan line j, n is an integer, z is a position along the focal axis, G_i is the transmission gray level between pairs of points separated by n pixels, and $f(z)$ is the focus score (see automatic focus evaluation section, pages 109-110). It would have been obvious to one of ordinary skill in that art at the time the invention was made to a gray scale comparison as taught by Brenner et al. in the system of Douglass et al. to provide fast, accurate repeatable focusing of samples (see Brenner et al, page 110, column 2).

Allowable Subject Matter

6. Claim 176 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter:

Claim 176 has allowable subject matter over the prior art for at least the reasons stated in the office action mailed 13 December 2006.

Response to Arguments

8. Applicant's arguments filed 13 April 2007 have been fully considered but they are not persuasive.

Applicant argues that Douglass does not select one of the plurality of coordinates to be the fine in-focus coordinate but only fits the data to a curve and then defines the peak as a fine focus position (see remarks, page 6, paragraph 4). The examiner respectfully disagrees and directs the applicant to column 12, lines 14-20 of Douglass where it states "It should be noted that for some combinations of cell staining characteristics, improved focus can be obtained by numerically selecting the focus position that provides the largest variance, as opposed to selecting the peak of the polynomial. In such cases, the polynomial is used to provide an estimate of best focus, and a final step selects the actual Z position giving highest pixel variance." Clearly, Douglass selects one of the plurality of coordinates to be the fine in-focus coordinate and the rejection is appropriate.

Regarding claim 135, the applicant has requested clarification on how figs. 11, 12 and 15 of Douglass demonstrate wherein the performance of the at least one of the fine focus actions comprises estimating an in-focus coordinate along the respective focal axis as a function of the in-focus coordinate of a global focal plane. The figures (especially fig. 15) demonstrate that the focal points/coordinates (e.g., 80, 82) are contained on global focal plane (fig. 15) and therefore the estimating is done as a function in-focus coordinate of a global focal plane.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lee Fineman whose telephone number is (571) 272-2313. The examiner can normally be reached on Monday - Friday 7:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on (571) 272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LAF
22 June 2007

Stephone B. Allen
Supervisory Patent Examiner